Abstract

BSCCO 2212, a high temperature superconductor currently under extensive experimentation at Fermilab has the potential to be used in next generation accelerator magnets which would operate in the field range of 20 - 50T. However BSCCO 2212's strain sensitivity is a considerable problem when operating in these high magnetic fields. In order to solve this problem alloy wire reinforcement to be used in high current multi-strand cables is being considered. These alloy wires have to fulfill two requirements, they must be mechanically strong, and they must be chemically compatible with 2212 wire. I performed tensile testing, and chemical compatibility testing on 5 different alloys, Inconel 600/625/X750, nickel chromium, and Kanthal A-1. Testing has indicated that Inconel X750 and Kanthal A-1 are possible candidates for 2212 reinforcement. Testing has also shown that titanium oxide and aluminum oxide coatings may be effective in reducing chemical interaction between 2212 wire and alloy wire.